

of the plurality of antennas,  $\sigma_{ij}$  is a covariance for the two signals,  $\sigma_{ii}$  is a variance for the one signal, and  $\sigma_{jj}$  is a variance for the other signal.

**17.** The apparatus of claim **16**, wherein performing blind spectrum sensing further comprises computing the detection statistic based on the correlation coefficients.

**18.** The apparatus of claim **17**, wherein computing the detection statistic based on the maximum correlation coefficients further comprises computing

$$T_{MCC} = \max_{1 \leq i < j \leq M} \left( \sqrt{N-2} \frac{|\rho_{ij}|}{\sqrt{1 - \rho_{ij}^2}} \right),$$

wherein  $T_{MCC}$  is the detection statistic,  $N$  is a number of the plurality of snapshots,  $\rho_{ij}$  is a correlation coefficient for the one (i) signal and the other (j) signal, and  $M$  is a number of the plurality of antennas.

**19.** The apparatus of claim **17**, wherein the detection threshold is a false alarm probability threshold that is determined theoretically based on theoretical computation of the distribution of the detection statistic and is determined prior

to performing the blind spectrum sensing, and wherein the false alarm probability threshold is determined based on a given false alarm probability.

**20.** A computer program product comprising a memory bearing computer program code embodied therein for use with a computer, the computer program code comprising:

code for performing blind spectrum sensing of a frequency band to determine whether a primary user is using the frequency band, wherein the blind spectrum sensing is based at least in part on a comparison between a detection statistic based on a maximum correlation coefficient, for correlations between a plurality of signals corresponding to a plurality of snapshots taken by a cognitive radio of the frequency band and corresponding to a plurality of antennas used by the cognitive radio for taking the snapshots, and a detection threshold based on theoretical computation of a distribution of the detection statistic; and

code for determining whether to communicate using the frequency band based on whether the blind spectrum sensing indicates the frequency band is or is not used by the primary user.

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